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RESPONSE UNDER 37 C.F.R. §1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2653



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Akihiko SHIMIZU et al.

Serial No.: 09/406,570

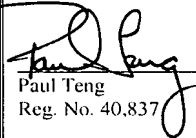
Group Art Unit: 2653

Date Filed: September 24, 1999

Examiner: Aristotelis M. Psitos

For: OPTICAL INFORMATION RECORDING MEDIUM WITH A PARTITION WALL
BETWEEN AN INFORMATION TRACKS GROOVE AND A PREFORMAT PIT
ENCODING INFORMATION THEREFOR

I hereby certify that this correspondence is being deposited this date with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.


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February 9, 2004
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AMENDMENT

This Amendment is submitted in response to the final Office Action dated December 1, 2003 in connection with the above-identified application.

Amendments to the claims are reflected in the **Listing of Claims** section which begins on page 2.

Remarks begin on page 10 of this paper.

Listing of Claims

The following listing of claims will replace all prior versions, and listings, of claims in the subject application:

1. (currently amended) An optical information recording medium comprising information tracks extending in a circumferential direction and spaced from each other in a radial direction by lands, wherein:

a first information track and a second information track are radially adjacent but are radially spaced from each other by a single land;

a first phase pit encoding preformat information for a first groove in the first information track is connected to the second information track and extends radially therefrom toward, but does not reach, the first information track;

~~said first phase pit and said first information track are separated radially by a partition wall;~~

said first phase pit and said first ~~information track~~ groove have substantially equal depths;

said first phase pit is radially connected with another groove adjoining on a side of the pit relative to the first groove;

a partition wall is formed in a radial direction between said first phase pit and said first groove;

obliques of the edge portions of said first phase pit are different; and

a track pitch of said first information track and a width and a length of said first phase pit are selected according to a condition that the preformat information for the first information track is reproduced from the first phase pit with a differential signal.

2. (original) The optical information recording medium as defined in claim 1,
wherein a width Δ of said partition wall in the radial direction and the track pitch TP
satisfy the relationship:

$$\Delta / TP \geq 0.1.$$

3. (original) The optical information recording medium as defined in claim 1,
wherein a width Wp of said phase pit, the length Lp of said phase pit in the
circumferential direction, the track pitch TP, and a spot diameter BD of a recording/reproducing
light beam satisfy the relationship:

$$Lp/BD < 1.0, \text{ and}$$

$$0.8 \leq WP/TP \leq 0.9.$$

4. (previously presented) The optical information recording medium as defined in claim
1,

wherein a width Wp of said phase pit, the length Lp of said phase pit in the
circumferential direction, the track pitch TP, and a spot diameter BD of a recording/reproducing
light beam satisfy the relationship:

$$1.0 \leq Lp/BD, \text{ and}$$

$$0.5 \leq WP/TP \leq 0.8.$$

5. (original) The optical information recording medium as defined in claim 1,
wherein a width Wp of said phase pit, the length Lp of said phase pit in the
circumferential direction, the track pitch TP, and a spot diameter BD of a recording/reproducing

light beam satisfy the relationship:

$$1.0 \leq L_p/BD, \text{ and}$$

$$0.8 \leq WP/TP \leq 0.9.$$

Claim 6 (canceled).

7. (previously presented) The method of mastering as defined in claim 18,
wherein the values of said spot diameters BD1 and BD2 of said first and second exposing
light beams are respectively fixed to constant values; and

wherein the distance L between the spots of said first and second exposing light beams is
adjusted by changing the incident angle of at least one of said exposing light beams directed to an
object lens by use of a light deflection element.

8. (currently amended) An optical information recording medium comprising:
circumferentially extending grooves forming information tracks and phase pits forming
circumferentially extending preformat tracks; and
a partition wall ~~radially separating adjacent information tracks; formed in a radial~~
direction between a phase pit for a first groove and the first groove,
wherein said ~~grooves~~ first groove and phase ~~pits~~ pit are substantially equally deep,
said phase pits encoding preformat information for a given information track are pit is
radially spaced from the connected with another groove forming the given
information track by a partition wall adjoining on a side of the phase pit relative
to the first groove,
obliques of the edge portions of said phase pit are different, and

a track pitch of said given information track and a width and a length of said phase pits are selected according to a condition that the preformat information for the given information track is reproduced from said phase pits with a differential signal.

9. (previously presented) The optical information recording medium as defined in claim 8,

wherein a width Δ of said partition wall in the radial direction and the track pitch TP of said information track satisfy the relationship:

$$\Delta / TP \geq 0.1.$$

10. (original) The optical information recording medium as defined in claim 8, wherein a width Wp of said phase pits, the length Lp of said phase pits in the circumferential direction, the track pitch TP of said information tracks, and a spot diameter BD of a recording/reproducing light beam satisfy the relationship:

$$Lp/BD < 1.0, \text{ and}$$

$$0.8 \leq WP/TP \leq 0.9.$$

11. (original) The optical information recording medium as defined in claim 8, wherein a width Wp of said phase pits, the length Lp of said phase pits in the circumferential direction, the track pitch TP of said information tracks, and a spot diameter BD of a recording/reproducing light beam satisfy the relationship:

$$1.0 \leq Lp/BD, \text{ and}$$

$$0.5 \leq WP/TP \leq 0.8.$$

12. (previously presented) The optical information recording medium as defined in claim 8,

wherein a width W_p of said phase pits, the length L_p of said phase pits in the circumferential direction of said information tracks, the track pitch TP of said information tracks, and a spot diameter BD of a recording/reproducing light beam satisfy the relationship:

$$1.0 \leq L_p/BD, \text{ and}$$

$$0.8 \leq W_p/TP \leq 0.9.$$

13. (currently amended) An optical information recording medium comprising:
circumferentially extending grooves forming information recording tracks, and phase pits
encoding preformat information for said tracks; and
a partition wall formed in a radial direction between a phase pit for a first groove and the
first groove,

wherein phase pits encoding preformat information for a given track are radially spaced
from that track and ~~separated therefrom by a partition wall~~ and are connected to
an adjacent track,

said ~~grooves~~ first groove and phase pits pit are substantially equally deep,
said phase pit is radially connected with another groove adjoining on a side of the phase
pit relative to the first groove,

obliques of the edge portions of said phase pit are different, and

a track pitch of said given track and a width and a length of said phase pits are selected
according to a condition that the preformat information for the given information
track is reproduced from said phase pits with a differential signal.

14. (original) The optical information recording medium as defined in claim 13,
wherein a width Δ of said partition wall in the radial direction and the track pitch TP
satisfy the relationship:

$$\Delta / TP \geq 0.1.$$

15. (original) The optical information recording medium as defined in claim 13,
wherein a width Wp of said phase pits, the length Lp of said phase pits in the
circumferential direction, the track pitch TP, and a spot diameter BD of a recording/reproducing
light beam satisfy the relationship:

$$Lp/BD < 1.0, \text{ and}$$

$$0.8 \leq WP/TP \leq 0.9.$$

16. (original) The optical information recording medium as defined in claim 13,
wherein a width Wp of said phase pits, the length Lp of said phase pits in the
circumferential direction, the track pitch TP, and a spot diameter BD of a recording/reproducing
light beam satisfy the relationship:

$$1.0 \leq Lp/BD, \text{ and}$$

$$0.5 \leq WP/TP \leq 0.8.$$

17. (original) The optical information recording medium as defined in claim 13,
wherein a width Wp of said phase pits, the length Lp of said phase pits in the
circumferential direction, the track pitch TP, and a spot diameter BD of a recording/reproducing
light beam satisfy the relationship:

$$1.0 \leq Lp/BD, \text{ and}$$

$$0.8 \leq WP/TP \leq 0.9.$$

18. (currently amended) A method of mastering an optical information recording medium comprising information tracks extending in a circumferential direction and spaced from each other in a radial direction by lands, comprising:

exposing a master to a first exposing light beam for forming a first information track and a second information track that are radially adjacent but are radially spaced from each other by a single land;

exposing said master to a second exposing light beam for forming a first phase pit encoding preformat information for a first groove in the first information track, wherein said first phase pit ~~being~~ is connected to the second information track and extending radially therefrom toward, but not reaching, the first information track, said phase pit is radially connected with another groove adjoining on a side of the phase pit relative to the first groove, a partition wall is formed in a radial direction between said first phase pit and said first ~~information track being separated~~ radially by a partition wall groove, and said first phase pit and said first ~~information track having groove~~ have substantially equal depths;

wherein, when a spot diameter of said first exposing light beam is BD1, a spot diameter of said second exposing light beam is BD2, a distance between said first and second exposing light beams is L, and the width of said partition wall in the radial direction is Δ , the values of BD1, BD2, L, and Δ satisfy the relationship:

$$\Delta = L - [(BD1/2) + (BD2/2)]; \text{ and}$$

wherein a track pitch of said first information track and a width and a length of said first phase pit are selected according to a condition that the preformat information for

the first information track is reproduced from the first phase pit with a differential signal.

REMARKS

Claims 1-5 and 7-18 are pending and presented for examination in this application, with claims 1, 8, 13 and 18 being in independent form. Claim 6 was previously canceled. By this Amendment, claims 1, 8, 13 and 18 have been amended to place the claims in better form for examination and clarify the claimed invention. It is submitted that no new matter has been added by the present amendment. Accordingly, entry of this amendment is respectfully requested.

Claims 1, 7, 8, 13 and 18 were rejected under 35 U.S.C. § 102(b) or § 102(e) as allegedly anticipated by U.S. Patent No. 5,638,354 to Nakayama et al., or under 35 U.S.C. § 103(a) as purportedly obvious over Nakayama in view of U.S. Patent No. 5,666,345 to Takahashi et al. or Japanese patent application publication number 11-066630 ("the '630 reference"), Claims 2, 3, 9-11 and 15 were rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Nakayama as applied to claims 1, 8 and 13, and further in view of U.S. Patent 5,477,527 to Tsuchiya et al. Claims 2-5, 9-12 and 14-17 were rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Nakayama as applied to claims 1, 8 and 13, and further in view of U.S. Patent 5,673,250 to Mieda et al. or U.S. Patent 5,459,712 to Sugaya et al.

Applicants have carefully considered the December 1, 2003 final Office Action and the cited art, and respectfully submit that independent claims 1, 8, 13 and 18, as amended, are patentable over the cited art, for at least the following reasons.

This application relates to an optical information recording medium which is not substantially affected by cross-talk even when phase pits exist on the lands situated at the right and left sides of a groove and in which the preformat information encoded by phase pits can be reproduced reliably. Applicants found that these objectives are served by the features that (a) a phase pit encoding preformat information for a first groove is radially connected with another groove adjoining on a side of the pit relative to the first groove, (b) a partition wall is formed in a

radial direction between the phase pit and the first groove, and (c) obliques of the edge portions of the first phase pit are different. Independent claims 1, 8, 13 and 18 have been amended to more clearly recite these features.

Nakayama is the primary reference cited in the rejections. Nakayama is directed to an optical information recording medium having pregrooves and prepits for tracking formed in different positions of central lines, and a method for recording information to and regenerating recorded information from the optical information recording medium by tracking both a groove and a land.

Takahashi, as understood by Applicants, is directed to an optical memory disc medium with predetermined guide tracks and prepits. The '630 reference is directed to an optical information recording medium, wherein a phase pit indicating preformat information can be reproduced by a push-pull methodology. Takahashi and the '630 reference are cited in the Office Action for their purported disclosures of prepits which have depths equal to that of a track depth.

Tsuchiya, as understood by Applicants, is directed to an optical disc having a pit length, a track pitch and a pit width, in respective specified ranges. Tsuchiya is cited in the Office Action for its disclosure of specific track pitch, spot size and pit width values.

Mieda, as understood by Applicants, is directed to an optical recording medium having pit rows which are formed on every other boundary section. Mieda is cited in the Office Action as disclosing optical records having a plurality of pit formats available for maximizing system parameters, such as crosstalk reduction and increasing recording density. The Office Action states also that Figs. 3-5 of Mieda provide for a variety of parameters to be varied.

Sugaya, as understood by Applicants, is directed to an optical disk having a recording layer on which information is recorded at specific pitches in the form of pit trains. Sugaya, like Mieda, is cited in the Office Action as purportedly disclosing optical records having a plurality of

pit formats available for maximizing system parameters, such as crosstalk reduction and increasing recording density.

Applicants find no disclosure or suggestion by the cited art, however, of the features that (a) a phase pit encoding preformat information for a first groove is radially connected with another groove adjoining on a side of the pit relative to the first groove, (b) a partition wall is formed in a radial direction between the phase pit and the first groove, and (c) obliques of the edge portions of the first phase pit are different, as provided by the claimed invention recited in independent claims 1, 8, 13 and 18, as amended.

Since the cited art does not disclose or suggest each and every feature of the claimed invention, it does not render the claimed invention unpatentable.

Accordingly, for at least the above-stated reasons, Applicant respectfully submits that independent claims 1, 8, 13 and 18 as amended, and the claims depending therefrom, are patentable over the cited art.

If a petition for a further extension of time is required to make this amendment timely, this paper should be considered to be such a petition, and the Commissioner is authorized to charge the requisite fees to our Deposit Account No. 03-3125.

The Office is hereby authorized to charge any additional fees that may be required in connection with this amendment and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Reconsideration and allowance of this application are respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Paul Teng", is written over a horizontal line.

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